Name:…….…….Class:……Adm No:…….

BIOLOGY
2021/2022 FORM 2 TERM 1 OPENER EXAM-AUGUST
TIME:

INSTRUCTIONS.
Answer all the questions in the spaces provided.

1. State the function of the following organelles. (2mks)
   a. Lysosomes
      Contain lytic enzymes that destroy worn out cells.
   b. Ribosomes
      They are sites for protein synthesis
2. A student observed a row of 16 epidermal cells in a microscopic field that was 8mm in diameter. Calculate the average length of one cell in micrometres. Show your working. (3mks)

   Size of one cell = diameter of field of view
   Number of cells in field of view.

   8mm x 1000um
   1mm
   = 8000um
   16cells
   =500um
3. A student drew a 6cm diagram of a plant flower if the actual length of the flower was 12cm. calculate the magnification of the drawing made by the student. Show your working. (3mks)

   Magnification of a handlens = Drawing length
   Actual length of the object

   6cm = x0.5
   12cm

4. State three factors that affect the rate of diffusion. (3mks)
   Diffusion gradient
   Thickness of tissues
   Size of molecules
   Temperature
   Type of medium
   Surface area to volume ratio
5. An experiment was set-up in a laboratory as shown below.
   i. What will happen to visking tubing in M and N after two hours. (2mks)
      M – will swell / increase in size
      N – Will shrink / decrease

   ii. Explain the observations made in M. (2mks)

Sodium chloride solution is a hypertonic solution while distilled water is a hypotonic solution therefore distilled water molecules will move from the beaker to the visking tubing by osmosis making it to swell.

iii. What does visking tubing represent in a living organism? (1mk)
Cell membrane/ plasma membrane/plasmalema.

6. Distinguish between autotrophism and heterotrophism modes of nutrition. (2mks)
Autotrophism is a mode of nutrition in which some plants manufacture their own complex food substances from simpler substances such as carbon (IV) oxide and water while heterotrophism is a mode of nutrition that involves taking complex ready made food materials from plants and other animals.
7. State three properties of monosaccharides. (3mks)
They are soluble in water
They form sweet tasting solution
They are reducing sugars
They are crystalisable.
8. The equation below shows formation of a disaccharide.
Glucose + Glucose process p → Q + water
   i. Name process P. (1mk)
   Condensation
   ii. Product Q. (1mk)
   Maltose
   iii. Other than product Q named above name other two examples of disaccharides. (2mks)
   Sucrose
   Lactose
9. List four factors which affect enzyme controlled reaction. (4mks)
Temperature
pH
Specificity
Enzyme co-factors and co-enzyme
Enzyme inhibitors
Substrate concentration and enzyme concentration.

10. Name two nutrients that are absorbed without being digested by the enzymes in humans. (2mks)
Water
Vitamins
Mineral ions/salts
11. List three types of salivary glands. (3mks)
Sublingual
Sub-mandibular
Parotial sub-maxillary
12. Give two roles of saliva in the process of digestion. (2mks)
Lubricates food
Moistens food

Softens food
Dissolves food
Contains salivary amylase hence digests starch to maltose
Provides an alkaline medium for action of salivary amylase.

13. Differentiate between homodonts and heterodonts. (2mks)
Homodonts: are animals which have the same types, size and shape of teeth while heterodonts are animals with different types, size and shapes of teeth.

14. The diagram below represents the lower jaw of a mammal.

a. Name the mode of nutrition of the animal whose jaw is shown above. (1mk)
Heterotrophism
b. Mode of feeding. (1mk)
Herbivorous
c. Give a reason for your answer in (b) above. (1mk)
Presence of a diastema
d. Diet of the animal. (1mk)
Vegetation/ grass/green leaves.
e. Name the toothless gap labeled K. (1mk)
Diastema
f. Name the substance that is responsible for hardening of teeth. (1mk)
Calcium phosphate

15. State the roles of the structures found within a tooth:
a. Blood vessels. (1mk)
They supply nutrients to living tissues in the dentine.
Remove waste products from the dentine
b. Nerves. (1mk)
They detect heat, cold and pain in the tooth

16. List two major types of dental diseases. (2mks)
Dental carriers
Periodontal disease

17. Give two roles played by bile salts in the process of digestion. (2mks)
They aid in the breakdown of fats into tiny fat droplets to increase their surface area for digestion (emulsification)

They provide an alkaline medium which the enzymes work best.
They neutralize the acidic chime from the stomach.

18. Explain five ways in which the illume is adapted to its functions. (5mks)

Long and narrow to increase surface area for digestion and bring digested food into close contact with walls of the ileum for easier absorption.
Highly coiled to slow down movement of food thus allowing more time for digestion and absorption to take place.
Large number of villi and micro-vill to increase surface area.
Presence of thinner layer of cells to reduce diffusion distance of digested food.
Presence of dense network of capillaries in the villi into which amino acids, sugar and vitamins are absorbed.
Presence of lacteals in the villi for the absorption of fatty acids and glycerol.

19. The following is a dental formula of a certain mammal.

$I^0/_3\ C^0/_1\ Pm^3/_3\ m^3/_3$

i. Calculate the total number of teeth of the mammal. (2mks)

0 + 0 + 3 + 3 x 2 = 12
3 + 1 + 3 + 3 x 2 = 20
32 teeth

ii. Give the likely mode of feeding. (1mk)

Herbivorous

iii. Give a reason for your answer in (ii) above. (1mk)

It lacks incisors and canines in the upper jaw to create a horny pad.

20. Name the disease in humans caused by deficiency the following: (5mks)

i. Vitamin A
Night blindness
ii. Vitamin D
Rickets
iii. Vitamin C
Scurvy
iv. Iodine
Goiter
v. Iron
Anemia

b. State one function of water in the diet. (1mk)

it is a solvent of soluble food substances cooling of the body.
Provided the medium for transport of dissolved food substances.
Facilitates hydrolysis of food substances.

c. State five factors that determine energy requirements in human beings. (5mks)

Basal metabolic rate
Occupation/everyday activity
Age
Body size
Sex